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Application Failure Mode Effect Analysis for Risk Management in New Costumer Acceptance Project in Garment Industry With Approaching Project Management Body of Knowledge

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Abstract

Purpose: This research aims to identify risks at the time of fulfillment of the requirements set by the customer and determine their mitigation.

Method: In order to achieve the goal, researchers use the PMBOK approach that focuses on risk management by creating WBS and RBS. From the existing risks assessed using the FMEA method by conducting a survey to get the S, O and D values then calculating the RPN

Result: the highest RPN value in this study is 330 at risk 5.2. The understanding of PIC system and procedures in making the system, based on the result of brainstorming is decided that the mitigation is recruiting employee who is experienced in applying BSCI and factory evaluation audits due to the unavailability of employees who will become PIC compliance.

INTRODUCTION

Garment Industry in Indonesia grew in the middle of 1970. It marked with textile industry processed into garment. The investment of this textile and garment is from reallocated from some countries such as South Korea, China, Taiwan to Indonesia. Indonesia is chosen for economical production cost and its competitiveness (Zamroni Salim & Ernawati, 2015). The growth of garment industry for export oriented has big chance to developed by accepting the new costumer. Garment companies faces obstacles in accepting new costumer often. There are three main obstacles in accepting the new costumers from USA & Europe. First, about Social, Health and Safety Compliance. Second, for C-TPAT (Customs and Trade Partnership Against Terrorism). Third, is about Factory Evaluation.(Anner, 2020)

According to the experts, the failure in accepting the new costumer is because of the garment companies are not able to fulfill the requirement from those costumers from USA & Europe, therefore the approach of Project Management Body of Knowledge (PMBOK) & Failure Mode Effect Analysis (FMEA) is best option to find the solution. The reason writer choose PMBOK, is the best practical in terms of experience and knowledge made in forms of framework focused on project management. The approaching method by PMBOK will focus on the management risk and each risk will be valued by FMEA method. Post risk identification, risk priority and mitigation will be processed (Pertiwi, 2017).

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Risk management at PMBOK has following steps: risk management planning, risk identification, qualitative & quantitative risk analyze, risk mitigation planning, risk mitigation implementation and risk mitigation execution monitoring. At risk analyze step, FMEA is the method to process. (Chaouch et al., 2019; Raz & Hillson, 2005)

The research is done at PT. ABC as a garment factory located in West Java, produces garment for export oriented. PT. ABC is going to accept the new costumer from Europe for brand X. The condition required by brand X at the stage of pre-order placement is applying BSCI (Business Social Compliance Initiative) dan Factory Evaluation. BSCI is a famous business- based platform for companies committed to develop working condition in global supply chain. The principles of BSCI are no discrimination, fair renumeration, right working hours, health & safety work, no child labor, bonded worker, environment protection, Freedom of Association & Collective Bargaining, ethical business environment. Factory evaluation is all about the production standard to produce qualified products.

RESEARCH METHODS

Projects

It starts from Risk Management Planning. The method used is Work Breakdown Structure (WBS), aims to list the activities in fulfilling new costumer prerequisite (BSCI & Factory Evaluation). Next stage, doing a brainstorming with the experts and company management level and finding related journals for references in order to identify all activities from the WBS technique. At this stage, all activities storage in WBS will be identified as risk by Risk Breakdown Structure (RBS) method.

After all risks are identified, then qualitative risk analyze is to be done. FMEA method is selected to have the RPN (Risk Priority Number) (Kim & Zuo, 2018; Xiao et al., 2011; Zammori & Gabbrielli, 2012). RPN score is from the multiply of S (Severity), O (Occurrence) and D (Detection). S (severity), the level assessment of the problem impact. O (occurrence), an assessment of the probable cause of the error. D (detection), an assessment of the ability of product or process to detect the root cause. In order to have score S, O and D, it is done by a survey to the management level. The management are the Managers, four people and they have more than 5 years been working with the company. (Jahangoshai Rezaee et al., 2017)

The Project Management Body of Knowledge (PMBOK) is a widely used model of project management based on prior experience (Frederico, 2021). This standard does not distinguish between small and large projects, but small -sized projects, with their limited schedules and budgets, face challenges using the extensive structure proposed by this standard. It has been suggested that the standard can be adapted to each project within its specifications; however, the tailoring procedures are complex, time -consuming, and at times impossible to apply to small -sized projects (Zaheri et al., 2022)

Analysis

Based on the survey, the parameter risk factors are scaled with maximum point 10. The scale is described at Table 1. Each score S, O & D made, to find the average. In order to have RPN, S, O & D are to multiply. The highest RPN score tends to be the most critical and to be highly prioritized. The next step is to plan the risk mitigation. The critical risk is planned for the mitigation in order to reduce the risk itself. To be proposed to the company for its mitigation. The final step is to make the summary for all stages on this research.

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RESULTS & DISCUSSION

Planning the Project Management

The first step is to plan the risk management. It aims to decide the activities to be done in accepting the new costumer in garment factory. According to PMBOK, for deciding the project activities, it uses WBS method (Work Breakdown Structure)(Mahardika et al., 2023; Pangastuti & Latief, 2023). WBS is selected to identify activities to be done in a project. In this project, there are 2 conditions i.e.: Factory Evaluation and BSCI. The condition for Factory Evaluation is a standard required by the costumer brand X, which will be as a main guidance for garment making. The condition of Factory Evaluation please refer to Table 1.

Table 1.
The Criteria of Factory Evaluation

No	Evaluation Criteria	WBS
FE-1	Pre-Production activity	Based on 11 sub-criteria described as following WBS: System & Procedure Management, Procurement Tool/Equipment
FE-2	Fabric, trim and accessories	Based on 29 sub-criteria described as following WBS: System & Procedure Management, Procurement Tool/Equipment, Infrastructure Development
FE-3	Marker, spreading, cutting and fusing	Based on 28 sub-criteria described as following WBS: System & Procedure Management, Software Procurement, Infrastructure Development (Tools, Equipment)
FE-4	Embellishment	Based on 16 sub-criteria described as following WBS: System & Procedure Management
FE-5	In process manufacturing control and procedures	Based on 41 sub-criteria described as following WBS: System & Procedure Management, Infrastructure Development, Electricity Power Upgrading, Tool/Equipment Procurement
FE-6	Washing and drying section	NA
FE-7	Dry process	NA
FE-8	Trimming, pressing, measurement check activities.	Based on 17 sub-criteria described as following WBS: System & Procedure Management, Infrastructure Development, Electricity Power Upgrading, Document Making
FE-9	Final inspection, cleaning and packing activities	Based on 23 sub-criteria described as following WBS: System & Procedure Management, Infrastructure Development, Electricity Power Upgrading, Infrastructure Development (Tools, Equipment)
FE-10	In house QA activities	Based on 12 sub-criteria as following WBS: System & Procedure Management
FE-11	Maintenance and housekeeping	Based on 12 sub-criteria as following WBS: System & Procedure Management, Electricity Power Upgrading, Machine Procurement, Tool / Equipment Procurement
FE-12	General management and operations	Based on 7 sub-criteria as following WBS: System & Procedure Management
FE-13	Final product audit observation	Based on 2 sub-criteria as following WBS: System & Procedure Management

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The second, requirements implementing BSCI. Costumer "X" requires all the partners to apply the rule of manpower, human right, health and work safety, also environmental impact which is in line with the BSCI. You can have reference of BSCI through site: www.amfori.org . For the code of conduct of BSCI, to refer Table 2.

Table 2.
BSCI Code of Conduct

No	Principles	WBS
C-1	Legal compliance	Based on 2 sub-criteria as following WBS: System & Procedure Management, Document Making, Legal Arrangement
C-2	Management system	Based on 13 sub-criteria as following WBS: System & Procedure Management, Document Making
C-3	Freedom of association and right to collective bargaining	Based on 4 sub-criteria as following WBS: System & Procedure Management, Establishing Labor Union
C-4	Prohibition of discrimination	Based on 3 sub-criteria as following WBS: System & Procedure Management
C-5	Compensation	Based on 5 sub-criteria as following WBS: System & Procedure Management, Software Procurement
C-6	Working hours	Based on 5 sub-criteria as following WBS: System & Procedure Management, Software Procurement
C-7	Work place health and safety	Based on 21 sub-criteria as following WBS: System & Procedure Management, Training on Employees, Environment Laboratory Test, Addition on Employees
C-8	Dormitories / housing	NA
C-9	Prohibition of child labor	Based on 3 sub-criteria as following WBS: System & Procedure Management
C-10	Prohibition of forced labor and disciplinary measures	Based on 3 sub-criteria as following WBS: System & Procedure Management
C-11	Environmental and safety issues	Based on 5 sub-criteria as following WBS: System & Procedure Management

Among twenty-four criteria as stated previously, (13 Factory Evaluation and 11 BSCI criteria). Exclude three criteria. They are Washing and drying section (Factory Evaluation) and dormitories/housing (BSCI), are not available in PT. ABC. These 21 criteria explicate into 264 sub-criteria which will be grouped into 13 main activities. This grouping is decided from the brainstorming with the management level. The thirteen activities are explained as following Table 3.

Table 3. Main WBS Criteria

	Main Activities
1	Training on Employees
2	Addition on Employees
3	Document Making
4	Legal Arrangement
5	System & Procedure Management
6	Infrastructure Development (Tools, Equipment)
7	Infrastructure Development
8	Tool / Equipment Procurement
9	Machine Procurement
10	Software Procurement
11	Environment Laboratory Test
12	Upgrading Electricity Power
13	Establishing Labor Union

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Risk Identification

The most important in risk management of PMBOK is to identify all risks. In this research, RBS is used to identify the risks. At this stage, the identification results risk list as a part of the whole risk management plan. Journal as reference and expert opinion are needed. This research involves each one expert in Factory Evaluation & BSCI implementation in garment industry for more than 5 years experiences. Found 50 risks from 13 main activities based on the research and the brainstorming with the experts.

Table 4.
Risk Breakdown Structure

Level 1	Level 2		Journal References
1. Training on Employees	1.1	To set up the qualification of trainees.	(Santos, 2008), (Pertiwi, 2017)
	1.2	Instructor capability in training material mastery and delivering	(Barghi & Shadrokh sikari, 2020),(Pertiwi, 2017)
	1.3	Material Training Making	(Santos, 2008), (Pertiwi, 2017)
	1.4	Trainee seriousness in training.	(Santos, 2008), (Barghi & Shadrokh sikari, 2020), (Pertiwi, 2017)
2. Addition on Employees	2.1	Employee qualification selection.	(Pertiwi, 2017), (Domingos et al., 2008)
	2.2	Setting up the assessment test for employee recruitment.	(Pertiwi, 2017), (Domingos et al., 2008)
	2.3	Job Interview for employee selection.	(Pertiwi, 2017), (Domingos et al., 2008)
3. Document Making	3.1	To categorize the document criterion in document making.	(Pertiwi, 2017)
	3.2	The understanding of document makers for the document making.	(Barghi & Shadrokh sikari, 2020),(Pertiwi, 2017), (Domingos et al., 2008)
4. Legal Arrangement	4.1	To categorize the legal document criterion for legal arrangement.	(Pertiwi, 2017)
	4.2	The understanding of legal document makers for the legal document arrangement.	(Barghi & Shadrokh sikari, 2020),(Pertiwi, 2017), (Domingos et al., 2008)
5. System & Procedure Management	5.1	The determination of system criterion & procedure in system & procedure management.	(Pertiwi, 2017)
	5.2	The understanding of system & procedures manager in system & procedure management.	(Barghi & Shadrokh sikari, 2020),(Pertiwi, 2017), (Domingos et al., 2008)
	5.3	How details or not the procedures are.	(Pertiwi, 2017)

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Level 1		Level 2	Journal References
6. Infrastructure Development (Tools, Equipment)	6.1	Determination on tool and/or equipment specification to be made.	(Pertiwi, 2017), (Ghadage et al., 2020a)
	6.2	Skill of the tool and/or equipment maker.	(Pertiwi, 2017), (Rahimi et al., 2018)
	6.3	Tool and/or equipment maker sub-contract selection.	(Pertiwi, 2017), (Rahimi et al., 2018)
	6.4	The material selection on tool and/or equipment making.	(Pertiwi, 2017), (Ghadage et al., 2020a)
	6.5	Cost & budget on tool and/or equipment making.	(Ghadage et al., 2020a)
7. Infrastructure Development (Building)	7.1	Location decision on infrastructure development.	(Pertiwi, 2017)
	7.2	Timing on Infrastructure Development (Building).	(Pertiwi, 2017)
	7.3	The sub-contract selection on Infrastructure Development (Building).	(Pertiwi, 2017), (Rahimi et al., 2018)
	7.4	The material selection on Infrastructure Development (Building).	(Pertiwi, 2017), (Ghadage et al., 2020a)
	7.5	Cost & budget on Infrastructure Development (Building)	(Ghadage et al., 2020a)
	7.6	Weather influence on Infrastructure Development (Building).	(Ghadage et al., 2020a)
8. Tool / Equipment Procurement	8.1	Criterion on tool and/or equipment to purchase.	(Pertiwi, 2017)
	8.2	The quality/specification to buy.	(Ghadage et al., 2020a), (Rahimi et al., 2018)
	8.3	The knowledge of person in charge for the material.	(Barghi & Shadrokh sikari, 2020),(Pertiwi, 2017), (Domingos et al., 2008)
	8.4	The supplier information.	(Ghadage et al., 2020a)
9. Machine Procurement	9.1	The machine criterion determination to buy.	(Pertiwi, 2017)
	9.2	The machine quality/specification to buy.	(Ghadage et al., 2020a), (Rahimi et al., 2018)
	9.3	The knowledge of person in charge for machinery to buy.	(Barghi & Shadrokh sikari, 2020),(Pertiwi, 2017), (Domingos et al., 2008)
	9.4	The supplier information.	(Rahimi et al., 2018)
	9.5	The payment method to determine to the supplier.	(Ghadage et al., 2020a)

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Level 1		Level 2	Journal References
10. Software Procurement	10.1	The software criterion to determine when buying.	(Pertiwi, 2017)
	10.2	The software quality/specification to buy.	(Ghadage et al., 2020a)
	10.3	The knowledge of person in charge about software to buy.	(Barghi & Shadrokh sikari, 2020),(Pertiwi, 2017), (Domingos et al., 2008)
	10.4	The supplier information for the software to buy.	(Rahimi et al., 2018)
	10.5	The payment method to determine to the supplier.	(Ghadage et al., 2020a)
11. Environment Laboratory Test	11.1	Determination on environmental impact measurement criterion.	c, (Domingos et al., 2008)
	11.2	The borderline of environmental impact.	(Rahimi et al., 2018)
	11.3	Time measuring on environmental impact.	(Barghi & Shadrokh sikari, 2020)
	11.4	Budget and cost on environmental impact measurement.	(Ghadage et al., 2020a)
	11.5	The knowledge of person in charger on environmental impact measurement.	(Barghi & Shadrokh sikari, 2020),(Pertiwi, 2017), (Domingos et al., 2008)
12. Upgrading Electricity Power	12.1	On which location the lighting to be improve.	(Pertiwi, 2017)
	12.2	Execution time on electricity power upgrading (for the lighting).	(Barghi & Shadrokh sikari, 2020)
	12.3	The knowledge of person in charge on lighting.	(Barghi & Shadrokh sikari, 2020),(Pertiwi, 2017), (Domingos et al., 2008)
13. Establishing Labor Union	13.1	The knowledge and insight for the representative chosen.	(Barghi & Shadrokh sikari, 2020),(Pertiwi, 2017)
	13.2	The knowledge of person in charge in document making of the Labor Union.	(Barghi & Shadrokh sikari, 2020),(Pertiwi, 2017), (Domingos et al., 2008)

1.1. Risk Analysis.

Post identification risk, analyzing risk is needed to be done. The analysis risk in this research is qualitative risk analysis. Why? It is due to as following:

1. Easily to determine the priority.
2. By choosing qualitative risk analysis, the risk is classified refer to its possibility and impact to focus on which priority to be done.
3. No frequency to be decided. The result of qualitative risk analysis doesn't depend on the frequency.
4. No measurement on impact of the cost and time consumes, so it can accomplish faster.

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At this stage of qualitative risk analysis, the method used is FMEA. FMEA needs parameter to measure are S (Severity), O (Occurrence) and D (Detection). To be able to fill up S, O and D, survey to 4 correspondents is needed to be done. Those all 4 correspondents are in Managing position in PT. ABC with experience in the same field for more than 5 years. (Ghadage et al., 2020b; Pertiwi, 2017). Parameter measured during the survey as listed on table 5.

Table 5.
Parameter FMEA(Ghadage et al., 2020c)

Score	Occurrence	Severity	Detection
1	Very unlikelytooccur	Very low-will not affectthe process	Certain-fault will be caught on test
2/3	Unlikelytooccur	Low-may affecttheprocess	High
4/5	May occur about halfof the time	Medium-slightly affect the process	Moderate
6/7/8	Likelytooccur	High-mostly affectthe Process	Low
9/10	Very likely to occur	Very high-definitelyaffect the process	The fault will be passed to customer undetected

At table 6, rank result is measured from the highest to the lowest RPN score. The highest rank is the highest RPN score, indicates with number 1 (one). The lowest rank is the lowest RPN score, indicate in this research as number 49 (forty-nine). In this research, rank with indicate number 1 (one) is the most critical risk

Table 6.
FMEA

Level 1		Level 2		S	O	D	RPN	Rank
1	Training on Employees	1.1	To set up the qualification of trainees.	4.25	5.25	2.75	61.4	44
		1.2	Instructor capability in training material mastery and delivering	6.25	6.5	6.5	264	10
		1.3	Material Training Making	5.75	6	3	104	27
		1.4	Trainee seriousness in training.	6.25	6.5	7	284	6
2	Addition on Employees	2.1	Employee qualification selection.	5.5	4	3	66	40
		2.2	Setting up the assessment test for employee recruitment.	5	6	4.5	135	24
		2.3	Job Interview for employee selection.	5.25	6	5.5	173	19
3	Document Making	3.1	To categorize the document criterion in document making.	5.25	4.75	3	74.8	39
		3.2	The understanding of document makers for the document making.	6.75	6.75	6.75	308	3
4	Legal Arrangement	4.1	To categorize the legal document criterion for legal arrangement.	5.75	4.75	3	81.9	35

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Level 1		Level 2		S	O	D	RPN	Rank
		4.2	The understanding of legal document makers for the legal document arrangement.	6.75	6	6.75	273	8
5	System & Procedure Management	5.1	The determination of system criterion & procedure in system & procedure management.	5	5.25	3	78.8	36
		5.2	The understanding of system & procedures manager in system & procedure management.	7.25	6.75	6.75	330	1
		5.3	How details or not the procedures are.	6.5	6.5	5.5	232	14
6	Tool and/or equipment maker sub-contract selection.	6.1	Determination on tool and/or equipment specification to be made.	6.25	5.25	2.75	90.2	31
		6.2	Skill of the tool and/or equipment maker.	6.75	6.25	4.25	179	18
		6.3	Tool and/or equipment maker sub-contract selection.	6.75	6.25	3.75	158	22
		6.4	The material selection on tool and/or equipment making.	5.5	5.75	5.25	166	21
		6.5	Cost & budget on tool and/or equipment making.	4.75	4.25	2.25	45.4	48
7	Infrastructure Development (Building	7.1	Location decision on infrastructure development.	6.25	4	2.5	62.5	43
		7.2	Timing on Infrastructure Development (Building).	4.25	4	2.5	42.5	50
		7.3	The sub-contract selection on Infrastructure Development (Building).	6	6.25	4.5	169	20
		7.4	The material selection on Infrastructure Development (Building).	5.5	4.75	3	78.4	37
7	Infrastructure Development (Building	7.5	Cost & budget on Infrastructure Development (Building)	4.75	4.5	3	64.1	42
		7.6	Weather influence on Infrastructure Development (Building).	6.25	6.75	7.75	327	2
8	Tool / Equipment Procurement	8.1	Criterion on tool and/or equipment to purchase.	6.25	4.5	3	84.4	34
		8.2	The quality/specification to buy	6.75	6.75	6	273	8
		8.3	The knowledge of person in charge for the material.	7.25	5.5	7	279	7
		8.4	The supplier information.	6.25	4.75	3	89.1	32
		8.5	Payment method to supplier	4.25	4.5	2.75	52.6	47
9	Machine Procurement	9.1	The machine criterion determination to buy.	7.25	4.5	3	97.9	30

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Level 1		Level 2		S	O	D	RPN	Rank
		9.2	The machine quality/specification to buy.	7.25	6.75	5.25	257	12
		9.3	The knowledge of person in charge for machinery to buy.	6.75	5.5	7	260	11
		9.4	The supplier information.	5.75	4.75	2.75	75.1	38
		9.5	The payment method to determine to the supplier.	4.75	4.5	2.5	53.4	45
10	Software Procurement	10.1	The software criterion to determine when buying.	7.25	4.5	3.5	114	26
		10.2	The software quality/specification to buy.	7.25	6.75	6	294	5
		10.3	The knowledge of person in charge about software to buy.	6.75	5.5	6.75	251	13
		10.4	The supplier information for the software to buy.	5.75	4.75	3.75	102	28
		10.5	The payment method to determine to the supplier.	4.75	4.5	2.5	53.4	45
11	Environment Laboratory Test	11.1	Determination on environmental impact measurement criterion.	6.75	4.25	3	86.1	33
		11.2	The borderline of environmental impact.	6.75	4.5	3.25	98.7	29
		11.3	Time measuring on environmental impact.	5	6	5	150	23
		11.4	Budget and cost on environmental impact measurement.	4.25	3.5	3	44.6	49
		11.5	The knowledge of person in charger on environmental impact measurement.	6.5	6.5	7	296	4
12	Upgrading Electricity Power	12.1	On which location the lighting to be improve.	6.75	3.5	2.75	65	41
		12.2	Execution time on electricity power upgrading (for the lighting).	7.5	6.75	3.75	190	16
		12.3	The knowledge of person in charge on lighting.	7	5.75	4.5	181	17
13	Establishing Labor Union	13.1	The knowledge and insight for the representative chosen.	4.25	5.75	5.25	128	25
		13.2	The knowledge of person in charge in document making of the Labor Union.	4.75	6.75	6.5	208	15

1.2. Risk Mitigation Planning

Post RPN score from all risks, to decide above RPN score 250, there are 13 most critical. (Ghadage et al., 2020b; Pertiwi, 2017). May have a look at Table 7.

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Table 7.
13 Critical Risks.

Level 1		Level 2		RPN	Rank
5	System & Procedure Management	5.2	The understanding of system & procedures manager in system & procedure management.	330	1
7	Infrastructure Development (Building	7.6	Weather influence on Infrastructure Development (Building).	327	2
3	Document Making	3.2	The understanding of document makers for the document making.	308	3
11	Environment Laboratory Test	11.5	The knowledge of person in charger on environmental impact measurement.	296	4
10	Software Procurement	10.2	The software quality/specification to buy.	294	5
1	Training on Employees	1.4	Trainee seriousness in training.	284	6
8	Tool / Equipment Procurement	8.3	The knowledge of person in charge for the material.	279	7
8	Tool / Equipment Procurement	8.2	The quality/specification to buy	273	8
4	Legal Arrangement	4.2	The understanding of legal document makers for the legal document arrangement.	273	9
1	Training on Employees	1.2	Instructor capability in training material mastery and delivering	264	10
9	Machine Procurement	9.3	The knowledge of person in charge for machinery to buy.	260	11
9	Machine Procurement	9.2	The machine quality/specification to buy.	257	12
10	Software Procurement	10.3	The knowledge of person in charge about software to buy.	251	13

Based on Table 10, resulted the most critical risk is 5.2. The understanding of system & procedures manager in system & procedure management with RPN Score 330.

The next stage is to plan the mitigation from 10 risks by having brainstorming with the Management Level in the company and the Experts. The result of mitigations is as following:

1. Risks: 5.2 The understanding of system & procedures manager in system & procedure, 3.2 The understanding of document makers for the document making, 11.5 The knowledge of person in charger on environmental impact measurement, 4.2 The understanding of legal document makers for the legal document arrangement, refer to the result of brainstorming, it is decided to recruit experienced employee in field of BSCI implementation and Evaluation Factory Audit as it is longways to go to train the current employee to be the person in charge for Compliance department. The person in charge for Compliance is a responsible employee for implementation Compliance

2. Risk 7.6 Weather influence on Infrastructure Development (Building), based on the brainstorming outcome, it is decided that the mitigation is to make a temporary cover with a hard thick plastic non-woven ply in order to protect it from rain. The decision is being made due to the new infrastructure is at the outer part of the main building.

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3. 10.2 The software quality/specification to buy, 8.3 The knowledge of person in charge for the material, 8.2 The quality/specification to buy, 9.3 The knowledge of person in charge for machinery to buy, 9.2 The machine quality/specification to buy, 10.3 The knowledge of person in charge about software to buy, refer to the brainstorming outcome, is decided the mitigation is to find as many references as about the software, tool and or equipment to plan to buy.
4. 1.4 Trainee seriousness in training, refer to the brainstorming outcome, is decided the mitigation is that the training is being held out of working hours to make sure that the operational work is not interrupted from.
5. 1.2 Instructor capability in training material mastery and delivering, refer to the brainstorming outcome, is decided the mitigation is so find the experienced training instruction.
6. Critical Risk Mitigations can be seen from Table 8.

Table 8.
Risk Mitigation.

	Risk	RPN	Mitigation
5.2	The understanding of system & procedures manager in system & procedure management.	330	To recruit the experienced employees in term of the implementation of BSI and Factory Evaluation Audit.
7.6	Weather influence on Infrastructure Development (Building).	327	To make a temporary cover to protect from rain.
3.2	The understanding of document makers for the document making.	308	To recruit the experienced employees in term of the implementation of BSI and Factory Evaluation Audit.
11.5	The knowledge of person in charger on environmental impact measurement.	296	To recruit the experienced employees in term of the implementation of BSI and Factory Evaluation Audit.
10.2	The software quality/specification to buy.	294	To find as many references as about the software, tool and or equipment to plan to buy.
1.4	Trainee seriousness in training.	284	Training time is being held out of working hours.
8.3	The knowledge of person in charge for the material.	279	To find as many references as about the tool and or equipment to plan to buy.
8.2	The knowledge of person in charge for the material.	273	To find as many references as about the tool and or equipment to plan to buy.
4.2	The understanding of legal document makers for the legal document arrangement.	273	To recruit the experienced employees in term of the implementation of BSI and Factory Evaluation Audit.
1.2	Instructor capability in training material mastery and delivery	264	To search for the experienced training instructor in the field.
9.3	The knowledge of person in charge for machinery to buy.	260	To find as many references as about the machine to plan to buy.
9.2	The machine quality to buy.	257	To find as many references as about the machine to plan to buy.
10.3	The knowledge of person in charge about software to buy.	251	To find as many references as about the software, tool and or equipment to plan to buy.

Managerial Implications

In order to company able to maintain the existed costumers and find some more, here are the following can be done: The consistency and commitment in implementing BSCI code of conduct and factory evaluation points. Continual Improvement due to an external audit (from the costumer) is to

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be done every year which this could have decisional impact on the garment order from the costumer to the company. Company has to develop an integrated technology information for a better controlling

CONCLUSION

In accordance with analysis and brainstorming for Failure Mode Effect Analysis (FMEA) for risk management in new costumer acceptance in garment factory with approach Project Management Body of Knowledge, herebelow the conclusions:

1. The requirements from new costumer "X" is Factory Evaluation and BSCI. There are 13 criteria for Factory Evaluation and 11 criteria for BSCI. From 24 criteria, 3 criteria are not applicable as the factory, PT. ABC are not available for the facilities. Those 3 criteria are 2 for Factory Evaluation i.e., Washing and drying section, Dry process and 1 criterion is for BSCI i.e.: dormitories/housing. Based on 21 criteria, they are to be expanded into 264 sub-criteria. Every sub-criterion creates the activity to do with WBS method. Those 264 activities to group into 13 main activities.
2. Having the Experts and Managers from the company brainstorming, the 13 main activities by WBS methode, they becomes 50 risks.
3. Having Survey for 50 risks to all the Managers in the Company in order to have score S (severity), O (occurrence) dan D (detection). To have RPN (Risk Priority Number) score, having the score of S, O and D by multiplying them. Then it comes to conclusion that the most critical risk in point 5.2. The understanding of system & procedures manager in system & procedure management with RPN score 330.

For risk point 5.2 The understanding of system & procedures manager in system & procedure management, based on the brainstorming, decided the mitigation is to recruit the experienced employee in implementing BSCI and Factory Evaluation Audit, due to the position in the company is not available yet. By having the experienced employee, there would be the person who responsible in implementation of BSCI & Factory Evaluation for the whole process.

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